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ORIGINAL ARTICLES

CARBON TETRACHLORIDE IN TREATMENT OF HOOKWORM DISEASE.*

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When, following a series of experiments on dogs, Dr. Maurice C. Hall, in 1921, suggested carbon tetrachloride as a remedy for hookworm disease in man, it is to be doubted if he, himself, realized the far-reaching possibilities incident to this suggestion. It is singular that most of the pioneer work relating to the usefulness of this drug has been done in foreign countries. Most notably by Dr. C. N. Leach in Ceylon, Dr. L. Nicholls in Colombo, and Dr. S. M. Lambert in Fiji.

The conclusions of the later writer were based on the treatment up to October, 1922, of 50,000 hookworm patients by carbon tetrachloride. If the conclusions of this writer are correct, and if my own conclusions based on the treatment during the past two months of nearly 100 cases are to be relied upon, we have in this agent a remedy so potent for hookworm eradication that it must be regarded throughout the South as probably the greatest medical discovery in recent years. For a large portion of the world's population, this new agent for eradication of hookworm must be regarded as rivalling in importance the use of antitoxin for diphtheria, quinine for malaria, mosquito eradication for prevention of yellow fever, and vaccination for prevention of smallpox. If my conclusions are correct, this remedy on account of the ease of administration, safety, and wide field for its application, is destined to fairly change the complexion of the children of the South, and overcome one of the greatest handicaps incident to life in our Southern States. As an economic instrument its value cannot be computed in dollars and cents, and as a health measure bearing intimately on the welfare of countless numbers of our population it must be heralded as one of the most brilliant discoveries of modern medicine.

Comparatively little has appeared in medical literature concerning this agent, and most of the written articles deal with statistical data, proving the worth of carbon tetrachloride as an anthelmintic, while but little has been written concerning the dosage and mode of administration. A brief reference to this last practical point was made by Dr. Lambert in the *Journal of the A. M. A.* for February 24, 1923, and with this information at my disposal, I have been able to treat nearly one hundred patients during the past two months and to tabulate a report giving the results of such treatment.

Owing to my connection with the Children's Home Society of Florida, I enjoy exceptional opportunities for observation and treatment of hookworm disease, since about 90 per cent of the children admitted to this institution are, at the time of their admission, suffering from hookworm infection.

The treatment of hookworm disease by thymol and chenopodium has always been unsatisfactory, since from six to twenty-one treatments are usually required to effect a cure. In many instances even a greater number are necessary. In addition to the lack of effectiveness of these two remedies, the disagreeable nature of the drugs, combined with their dangerous properties, have rendered them so objectionable that their universal employment has been largely curtailed. In carbon tetrachloride, it appears that we have

*This paper was intended for presentation before the Fiftieth Annual Meeting of the Florida Medical Association, held at Jacksonville, May 15-16, 1923, but owing to an overcrowded program the essayist did not have an opportunity.

a drug which renders the stools hookworm-free in about 90 per cent of the cases, as the result of a single treatment. A contrast between the results secured from the use of this agent and previously employed remedies is obvious and striking. It is much easier to administer than either thymol or chenopodium, more palatable than either, more laxative, produces fewer disagreeable symptoms, is safer, and requires no preliminary purgation or starvation. I can make no definite statement as to the safety of the drug till it has been more universally employed, but will say in passing that in only two of my cases were there disagreeable results, and these consisted in vomiting, lasting about twelve hours.

I am able to report as having been successfully treated through this agency, during the past two months, ninety cases of hookworm disease. Of these, seventy-four cases, or 82 per cent, were rendered hookworm-free by a single dose. Twelve cases, or 13 per cent, required two doses, and four cases, or 4.4 per cent, were given the third dose. Among the four cases requiring three treatments were two children who vomited the first dose given, which probably accounts for their lack of response. One of these patients is a boy four years of age who has been under my care for nearly two years. He is profoundly anæmic with a hemaglobin content of 30. This is one of the most profound and rebellious cases of hookworm infestation that has ever come under my observation. He has been given over sixty doses of thymol or chenopodium, apparently with no favorable results. Since he was rendered hookworm-free by carbon tetrachloride, it is no wonder that I am an enthusiastic advocate of the drug.

The dosage I have been employing is three minims to every year of age, but do not exceed thirty-five minims in any instance. A child of 5 years, therefore, requires fifteen minims. One must distinguish between minims and drops of this agent, since a minim of carbon tetrachloride consists of from three to five drops, administered from an ordinary medicine dropper. The dose may be measured either from a minim graduate or a minim pipette. In prescribing it for my private patients I order twice the amount indicated for a single dose, directing that it be dispensed in a one-dram vial. The patient is instructed to take one-half the contents of the vial in a single dose, the remainder being retained for further employment if such is found necessary. It is administered from a tablespoon which has been half filled with either plain or sweetened water and the required dose is dropped from the pipette into the center of the spoon. It is taken in a single swallow and occasions little or no aversion.

The patient is given his usual evening meal and in the morning the drug is administered on an empty stomach. No food is given for three hours afterwards. Preliminary purgation is unnecessary, and on account of the slight laxative properties of the drug, it is contended by some that a post-purge is likewise unnecessary; however, it is my own practice to administer, one hour after the carbon tetrachloride, a single large dose of Epsom salts. I follow this procedure because it has been ascertained that for the most part the drug does not undergo absorption in the alimentary tract and can be largely recovered from the intestinal excretion. Since it is a drug distinctly foreign to the intestines, I feel that it should be eliminated as early as possible after it has produced the desired results.

The drug has a slight anthelmintic action on other parasites than the hookworm, but in this respect is probably inferior to remedies previously employed. In cases of infestation with both hookworm and ascaris it may be combined with a few minims of chenopodium or even with thymol.

Castor oil as a post-purge is not advised, not that it brings out any toxic action of the carbon tetrachloride, but we know it does interfere with its effectiveness.

I would caution against the use of the commercial product and recommend the employment of a chemically pure preparation. Commercial carbon tetrachloride is unfit for

administration on account of the presence in it of carbon sulphid and carbonyl chloride. The only fatal results so far reported were associated with the use of an impure preparation of the drug.

Should a more universal employment of this agent verify present conclusions, doubtless the drug will commend itself to State and county health authorities as appropriate for mass treatment in localities with a high degree of infestation.

SOME CHRONIC NASAL CATARRHS, THEIR CAUSE AND CURE.*

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The reason why so many cases of the chronic nasal catarrhs remain uncured will appear in the consideration of the treatment, but that they are among the maladies and ills of the flesh for which a favorable prognosis should be made, I fully believe.

If the accepted principles of treatment as now applied by the modern rhinologist be permitted by the patient, fully 95 per cent of these cases should be restored to function, and that, as I take it, is the all-important desideratum.

I am prompted to discuss, under its common though quite unscientific name of catarrh, some of the more chronic forms of this everyday disease, because of the fact that a pessimism as to its cure prevails; and to review our knowledge of some of the causes that tend to produce it, as well as the methods which lead to its relief and final cure; also to spread the gospel of optimism in these cases, where more or less doubt has heretofore prevailed.

By the term catarrh we understand that there is a pathologic condition present, due to local or constitutional causes, which so irritates the mucous and serous cells of the nasal mucosa that an alteration in both the quantity and quality of their product is brought about to such an extent that the normal physiological functions of the nose are disturbed. These functions, as you know, are cleansing, warming and moistening the inspired air in addition to permitting its passage to the lower areas of the respiratory apparatus. A normally acting nose cleanses the air of dust, dirt, and bacteria, moistens the air to saturation regardless of the humidity of the surrounding air and raises its temperature to 86 degrees F., whatever the degree of cold outside the body. When it fails to do these things some pathology is present, whether general or local causes are behind it, and if it persists the condition is chronic.

Various names have been given to the milder of these chronic nasal catarrhs, such as simple chronic rhinitis, chronic catarrh, subacute rhinitis, chronic cold, chronic coryza, rhinorrhœa, and alternating stenosis.

The cause of this form of catarrh is repeated attacks of coryza, uncured rhinitis, the infectious diseases of childhood, dusty occupations, neglected adenoids, sinusitis, deviations of the nasal septum, or spurs on the septum. It occurs more frequently among men than women, in the young than the old and in the civilized than the uncivilized.

In most of these cases there is nasal obstruction, usually a deviation of the septum in its lower and middle portions, and with each inspiration a vacuum occurs posterior to the obstruction, and this negative pressure, or suction-like action, determines the blood to engorge the swell-bodies of the inferior turbinates, producing a turgescence that not only blocks the airway but through cell-changes lessens the secretion, makes it more mucous and less serous, adds an admixture of dead leucocytes, permits less saturation of the inspired air due to the altered secretion, and insufficiently warms the air due to the stasis present in the local nasal circulation. Continued venous engorgement results in an increase in the size of the cells of the involved structures and then hypertrophy has begun.

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In those cases with thickening of one or both sides of the base of the septum there is usually only a turgescence of the inferior turbinates, with little or no change in the middle turbinate region, but where, as is often the case, there is a deviation high up; there may be also turgescence of the middle turbinates, obstruction to drainage of the frontal and ethmoidal regions, pressure pains, neuroses, anosmia, hyperplasia of the mucosa of that region and a tendency to polypoid degeneration.

TREATMENT. — Cleansing stands first in importance, using warm and isotonic alkaline solutions for the removal of the thickened accumulated exudate. Borax, 2.5 per cent, soda bicarb., 1.5 per cent, boric acid, 2 per cent and sodium chloride 7 per cent, are all useful. Flavors may be added, also sugar and glycerine, to make the solutions more pleasant. A mineral oil with or without flavor or medication is generally a valuable protective. Removal of adenoids and the doing of other surgery when indicated, treatment of underlying general diseases, and attention to hygienic and dietetic rules must not be neglected.

Hypertrophic rhinitis, obstructive rhinitis, hypertrophic nasal catarrh, hypertrophic ozœna, hypertrophy of the turbinal bodies and hypertrophic rhinitis are some of the names for the most prevalent form of these diseases.

The causes are the same as in the chronic simple form, but acting over a longer period of time. Nasal obstructions rank first among the predisposing causes; there is compensatory hypertrophy of the inferior turbinate on the roomy side of the nose; it occurs most often in men; among those predisposed to it are neurotics, sedentary people, the weak, those suffering from emphysema, asthma, chronic bronchitis, and tuberculosis.

TREATMENT. — "Be assured that in most instances hypertrophic rhinitis is a surgical rather than a medical disease," is a thought I have borrowed from Ballenger and with which all will agree who have seen many of these cases.

Submucous resection of the nasal septum; removal of septal spurs, partial turbinectomies, seldom; removal of nasal polypi, or whatever of obstructing pathology is present, will meet the indications in a large number of cases and will be curative in proportion to its ability to remove the existing pathology and restore the nose to normal function.

Above and beyond all procedures stands the submucous resection of the septum, when indicated, in its ability to restore the nares to normal function. Formerly regarded as a very difficult and dangerous surgical operation, it has come to be reckoned, due to the improvements in instruments, technique and anæsthesia by the work and studies of such men as Freer, Ballenger, Killian and others, as reasonably easy and fairly safe, one most indispensable in the cure of many chronic nasal catarrhs, and without which many cases are doomed to remain in the incurable class. Medicine will not cure these cases because there exists a pathological obstruction which drugs have not the power to remove.

To do this operation successfully, the surgeon must know his nasal anatomy; must study his case beforehand and determine just what is to be done; must know how to meet and master the difficulties that arise now and then during the operation; he must know the technique of a good submucous resection; he must know what to remove and what to leave intact; he must have the surgeon's eagle eye and gentle touch—no rough hand here; he must give special care to high deviations and not leave too much of the basal ridges where present; he must not permit too much traumatism to the soft parts lest, instead of healing kindly, they melt away and leave behind a staring vacancy where once stood a sturdy though maybe crooked septal wall.

Our patients must have more training, urging and assurance from their family physicians, as well as the specialist, before they will yield themselves to surgery for the cure of catarrh, even though their refusal to accept it means failure to get relief from the ailment.

Alkaline irrigations and oily protective sprays are useful to meet some indications. Electro-cautery or chemical cautery with chromic or trichloracetic acid is sometimes useful in reducing the size of the inferior turbinate. Scissors, snare, spokeshave, swivel knife, or other cutting instruments have been used in reducing the size of a hypertrophied turbinate. Middle turbinates when obstructing drainage to the accessory sinuses will often need amputation of the anterior portion, but, as a rule, it is poor surgery to remove very much of the inferior turbinate.

If any sinusitis be present it will require treatment according to location, extent and kind of involvement present.

Atrophic rhinitis, ozœna, atrophic catarrh, coryza fœtida, and sclerotic rhinitis are some of the names for a disease which has been a reproach of the rhinologist.

This disease is fortunately more rare than formerly, some writers think, because adenoids receive attention where formerly they were neglected. Atrophic rhinitis occurs by preference between the ages of 7 and 12, rarely occurring after the age of 25. It occurs five times as often in females as in males. Contagion, heredity, or the inheritance of a predisposition to the disease, according to some writers, play a part in the causation. It is said that 50 per cent of all cases occur in the brachycephalic type of skull; sinus disease is often present; lues and tuberculosis are both supposed to predispose children to the disease. Perez claims to have discovered the specific bacterial cause, always present, infecting one to another. Recently Kozo Sakagami, writing in *The Lancet*, says: "(1) The so-called ozœna bacillus, obtained from the nasal passages of ozœna patients, agree in all important points with the cocco-bacillus of Perez. (2) The cocco-bacillus is found only in ozœna patients and not in patients suffering with other nasal diseases, and in healthy persons." Perez claims that every case of ozœna originates from another patient or from the muzzle of a dog, but De Simoni tried to infect others with crusts from ozœna cases and failed.

Brock and Bradt claim they have found that in 89 per cent of the cases with ozœna the Klebs-Loeffler bacillus is present, while in the non-fetid type about the same percentage show the absence of the Klebs-Loeffler bacillus. Theorize as we have and as others may, it must be admitted that there is no general agreement as to any one particular cause.

TREATMENT.—This is often slow and discouraging and formerly has required months and years of constant treatment. If the cases are not cured promptly we can at least ameliorate and alleviate some of the distressing features of the disease, even though it requires all our ingenuity, patience and skill.

The crusts are best removed by use of an abundance of warm isotonic alkaline solutions applied by irrigation, at times with force, in order to loosen and remove the inspissated and closely adherent exudates. Salt, soda, borax, boric acid, thymol, resorcin, and like drugs may be added to the water used.

Gottstein's cotton-wool plugs may be used. After cleansing, tampons soaked in 10 per cent aqueous solution of ichthyol are useful in stimulating the cells of the mucosa to normal action. Iodoform, europhen, boric acid, and olive oil have been used. Among pigments, Balsam Peru and Mandl's pigment may be painted on the mucous membrane.

Sinusitis, if present, must be relieved surgically in most cases. Fleischman of Berlin, in an article published in November, 1922, stated that the best results in these cases are to be had from systematic narrowing of the nose.

Lautenschlager has operated for the past eighteen years, using a Caldwell-Luc operation on the maxillary sinus to secure his avenue of approach to loosen and push over to the septum the antro-nasal wall which he keeps in place with tampons introduced into the antrum and changed in six or eight days the first time, and thereafter daily until the wounds heal, many cases necessitating a plastic operation to close the oro-antral opening. He claims the results are good. Other operators use tibial bone, silver, and magnesium plates, the advantage claimed for the

latter being that they are absorbed after a few weeks. These extraneous substances are inserted behind the mucous membrane of the outer nasal wall and serve to splint it and hold it over against the septum, thus narrowing the passage and relieving the ozœna.

More recently an intranasal operation method of surgical narrowing the nares has been devised by Max Halle and tried out in his clinic in a series of seventy-six cases with very good results.

Wolfson of Boston has observed forty-six cases in Halle's Clinic in Berlin, and personally performed five operations. Working through the nose under local anæsthesia, with knife, chisel and elevator, Halle separates the anterior end of the antro-nasal wall, introduces a strong elevator into the antrum through the nasal wall and pushes the part over towards the septum. Opposing areas of mucosa are scratched with a knife to promote union to hold the wall in. Tampons are introduced to the outer side and upper corner of the wall to hold it against the septum until healing takes place. These tampons are renewed every five days for four weeks when union should have taken place; tampons are then stopped and the wound allowed to heal, which it promptly does.

Wolfson reports in *The Laryngoscope* for February, 1923, that he had the privilege of observing seventeen cases, postoperative, seven cases after one year, three cases after two years, and two after three years. The results were good in all but three cases.

All these methods have been tried and have their advocates. Others have accomplished this narrowing of the nares by the injection of paraffine. These injections have been used and abused, cussed and discussed, succeeded and failed and the method has both friends and enemies. The dangers in its use are from embolus of the lung and of the central retinal artery. Those who use it agree that the melting point of the paraffine must be high in order that the substance may stay exactly where it is wanted and not stray away to do damage.

It must never be lost sight of in this as in the other forms of catarrh that any underlying constitutional or general disease such as pulmonary, cardiac, renal, cardio-renal, hepatic or blood diseases must have appropriate treatment.

Iodides are indicated in most of these cases whether syphilitic or not.

CONCLUSIONS.

Every case of chronic nasal catarrh needs competent individual study and classification before treatment is instituted.

Local treatment is curative in a small number of, and useful in meeting indications in most, cases.

Catarrhs that do not yield to six weeks of medical treatment should be referred to a specialist to determine the reason why, and for the removal or correction of such deviations, obstructions or other pathology as may be found to be preventing a cure.

A competent breathway is essential to nasal integrity. Efficient drainage of all accessory sinuses and æration of all parts of the nasal mucosa are indispensable conditions.

When obstructions are present, surgery is indicated in most cases to secure a normal breathway, without which treatment is largely a waste of time and money.

The *bete noir* of the rhinologist, atrophic rhinitis, promises to yield at last to modern surgical treatment.

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PRIMARY CARCINOMA OF THE PANCREAS.*

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Embryologically the pancreas is developed from two anlages. The dorsal pancreas begins as an out-pouching of the second portion of the duodenum; the ventral pancreas begins as a grooved bud arising from the common-bile duct near the ampulla of Vater. The two portions of the pancreas finally unite and form the pancreatic gland. There are two types of glandular tissue with separate and distinct functions: The acini of the tubular gland system excrete digestive ferments which are important in the digestion of proteins, fats and carbohydrates. The secretion is collected in the duct of Wirsung and the accessory pancreatic duct or duct of Santorini and is drained into the common-bile duct and into the duodenum. The second glandular structure within the pancreas is the islands of Langerhans, which have no ducts, and the secretion from these islands is taken up by the blood and is most important in the control of the intermediary carbohydrate metabolism. When a large number of these islands are destroyed and there is an insufficient supply of this internal secretion the clinical condition known as diabetes mellitus is evident.

Anatomically the pancreas is deep-seated in the epigastrium, its head lying in a loop of the duodenum, and frequently pancreatic tissue completely surrounds the common-bile duct. Its body and tail extend obliquely toward the left kidney and spleen.

Pancreatic inflammation and necrosis is frequently secondary to lesions of the biliary tract, gastric and duodenal ulcer. The pancreas may also be secondarily involved in malignant disease by direct extension from the stomach and common-bile duct. Metastatic involvement of the gland is rare. Primary carcinoma of the gland is not infrequent, and occurs in the head of the pancreas in about two-thirds of the cases. The tumor is rarely of large size and metastases reach the liver through the lymph channels.

The symptoms of carcinoma of the pancreas are due to its anatomical relations and to disturbance in function of the gland. You will recall that in about 50 per cent of individuals the common-bile duct is surrounded by pancreatic tissue and that the duct of Wirsung empties its contents into the common-bile duct near the ampulla of Vater. Necessarily when there is much swelling at the head of the pancreas the common-bile duct is obstructed, and intense jaundice is evident and persistent. Pain of various types is also an important symptom. Sometimes it is colicky in character and is probably due to obstruction of the ducts; many times it is so intense that it simulates gallstone colic. When the pancreatic ducts are obstructed so that there is insufficient external secretion entering the duodenum for digestion of proteins, fats and carbohydrates, we usually find large stools containing neutral fats, fatty acids, and undigested meat fibres. Frequently there is diarrhœa due to undigested food. Various symptoms of indigestion, which are not characteristic, may arise, but loss of weight is usually evident. In some instances the tumor may be palpable in the epigastrium; it is usually hard, firm and slightly tender.

I wish to report the histories of two cases of primary carcinoma, which bring out the main clinical symptoms of the disease. The prominent symptom in the first patient was intense jaundice; the striking symptom in the second patient was severe colicky pain.

The first patient is Mr. C., age 65, who came in complaining of jaundice, indigestion, clay-colored stools and highly-colored urine. His mother died of tuberculosis. The patient's general health has always been good. Present illness began four weeks before the examination. At the onset he felt a little "bum," promptly developed jaundice, poor digestion, puffiness after eating, slight nausea but no vomiting, slight pain and soreness in the epigastrium. On examinaton the

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striking points of interest were intense jaundice; slight abdominal distention; enlargement of the liver, edge extending down to the level of the umbilicus; gallbladder distinctly palpable but not tender; distinct tenderness in the epigastrium but no mass was palpable; stools were clay-colored, containing no bile—the fats in his diet had been restricted — the urine was highly colored, almost a mahogany brown. Diagnosis of cancer of the head of the pancreas with obstruction of the common-bile duct was made and the patient referred for operation. The growth was found in the head of the pancreas and treated with radium. The gallbladder was anastomosed to the jejunum. Jaundice cleared up by drainage of the bile through the gallbladder into the intestine. Liver returned to normal size and gallbladder was no longer palpable. The patient improved. Later the mass in the epigastrium was distinctly palpable, about the size of a small hen's egg, hard, firm. About eleven months after the onset of illness patient developed obstructive symptoms as nausea, vomiting, epigastric pain, gurgling sounds on auscultation over the pyloric region and definite visible peristalsis; almost complete occlusion of the duodenum was found. Gastroenterostomy was done. Three months later patient developed severe chill, high fever which resembled a malarial infection; following some of the attacks he had definite jaundice. Blood was negative for malarial parasites, and knowing the pathological condition it was self-evident that he was having an acute cholangitis, sometimes known as intermittent hepatic fever. Patient died fifteen months after the onset of symptoms.

The second patient, Mr. R., age 55, came in complaining of attacks of colicky pain and soreness across the right upper abdomen, gas attacks, loss of 28 pounds in weight. His general health has always been good. Measles at 6; mumps at 8; typhoid fever at 13; dengue fever at 30; inflammatory rheumatism at 33; chills and fever one year ago. Habits: temperate. Present illness began eight months before examination and he has gradually grown worse. At the onset he had a bloated feeling after meals and occasionally a colicky pain; the attacks of colic have grown frequent and more severe. At the present time he has daily recurrences of the attacks after eating, troubled a great deal with gas; has had no nausea, vomiting or diarrhœa. Has lost twenty-eight pounds in weight during the last eight months. Recently his skin has become slightly discolored. He has had no clay-colored stools; the bowels have been markedly constipated. On physical examination patient was underweight, sallow color, slightly icteric. Liver edge was palpable about three fingers' breath below the costal margin; gallbladder was not palpable; a small mass was palpable in the epigastrium which was hard and very tender. The stools were not clay-colored; urine contained bile. Gastric analysis: free hydrochloric acid, 40; total acid, 60. Patient was operated upon and the mass was found to be carcinoma of the head of the pancreas. The gallbladder was anastomosed to the jejunum which relieved the jaundice. Patient died a few months later.

The evidence of carcinoma of the pancreas in these two patients, ages 55 and 65, is persistent obstructive jaundice with distention of the liver and gallbladder with bile; epigastric pain which was mild in the first patient, severe and colicky in the second; palpable mass in the epigastrium which was small, firm and tender; loss of weight; the complications were duodenal obstruction and acute cholangitis. The condition which is likely to be confused with carcinoma of the pancreas is gallbladder disease associated with jaundice and colic.

A careful history and physical examination will, as a rule, reveal the nature of the disease.

PROPAGANDA FOR REFORM.

More Mibranded Nostrums.—The following products have been the subject of prosecution by the federal authorities charged with the enforcement of the Food and Drugs act: Healing Springs Water (Virginia Hot

Springs Co.), a moderately mineralized water, containing bicarbonates of calcium and magnesium, and magnesium sulphate (Epsom salt); Brick's Sarsaparilla (Palestine Drug Co.), containing small amounts of sodium salicylate, potassium iodid, plant drug extractives, including sarsaparilla and a laxative drug, sugar, alcohol and water; Yerk's Wine Extract of Cod Liver Oil (Yerk's Chemical Co.), consisting essentially of compounds of sodium, potassium, calcium, iron, quinin, strychnin and phosphorus, extracts of plant drugs, possible traces of cod-liver oil, malt extract, sugar, alcohol and benzaldehyde as a flavoring; Anemia Tablets (Carlos M. Rivoll), containing 95 per cent of milk sugar and small quantities of cinchona alkaloids, charcoal, sulphur, gum and compounds of arsenic, phosphorus, iron and sodium. (*Jour. A. M. A.*, Feb. 3, 1923, p. 343.)

BAYER 205.—This is said to be a specific trypanosomid. It is said to have no effect on organisms other than the trypanosomes, even those that are nearly related such as the spirocetes. Most of the work carried out in this country has been carried out with small laboratory animals, but the successful treatment of two human cases of trypanosomiasis is reported. The composition of Bayer 205 is secret, though a hint as to its chemical composition has been discovered which suggests that it is a dye of the naphthalene series. It is hoped that in the near future the exact composition of Bayer 205 will be declared so that scientists will feel justified to carry out controlled experiments with the drug. For the present the preparation is in the experimental stage. (*Jour. A. M. A.*, Feb. 10, 1923, p. 406.)

A PATENTED CONSUMPTION CURE.—The U. S. Patent Office has issued patents for many preparations to be used in medicine for which there has not been the slightest scientific justification. The most recent and most flagrant lack of intelligent patent law administration is to be found in a patent issued to Sergluson and exploited by the Savrite Medical Manufacturing Co., Los Angeles, Cal., for an alleged cure for tuberculosis. This is the patented cure: Pure olive oil, 1 gallon; squill root, 3 pounds; bitter almonds, 1⅛ pounds; nettle (the plant except the root), 1½ pounds; red poppy flower petals, 1 pound. These various ingredients are to be mixed, put in a closed container, gradually warmed and left standing for about 72 hours, when the mixture is squeezed, mixed and filtered. The filtrate comprises the "cure." (*Jour. A. M. A.*, Feb. 10, 1923, p. 420.)

ALLEN'S GOITER TREATMENT.—At Sheffield, Ia., the Allen Remedy Co. conducts a mail-order business in "Dr. C. J. Allen's Goiter Treatment." The A. M. A. Chemical Laboratory analyzed the Allen nostrum and found it to consist essentially of ferrous iodide and hydrogen iodide (hydriodic acid) in a colored and flavored syrup. The serious side of the Allen Goiter Remedy Co. business is the indiscriminate sale of the nostrum to those who may be, and are likely to be, suffering from exophthalmic goiter. It is well known that the use of iodin is likely to aggravate this disease and hence it is not surprising that physicians are beginning to report serious results from the use of the Allen preparation. (*Jour. A. M. A.*, Feb. 24, 1923, p. 572.)

STRYCHNIN AND DISTURBANCES OF THE VISION.—The use of strychnin in the treatment of certain visual disturbances appears to be extensive. Its use in opthalmology was introduced in 1830. In text-books the claims for the usefulness of the drug in these conditions run from mere assertions regarding the usefulness of the drug in certain eye conditions to statements that it actually increases the acuity and field of vision within an hour after injection of therapeutic doses. Occasionally there is a statement to the effect that the good results from strychnin are due to psychic influences. And now, ninety-two years after its proposed use, experiments have been made to indicate that the latter opinion is probably correct and that strychnin is without action on vision. (*Jour. A. M. A.*, Feb. 10, 1923, p. 406.)

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OUR FIFTIETH ANNIVERSARY MEETING.

THE JOURNAL is going to press as our Jubilee Meeting is in session. We, therefore, have not the time to dwell in detail concerning the sessions or to prepare the Proceedings which will appear in the June issue as has been customary in the past. Suffice it to say at this time that the Fiftieth Anniversary Meeting held in Jacksonville marks a new era for organized medicine in this state. More anon.

A CHEERFUL PROSPECT IN THE FIELD OF PUBLIC HEALTH ACTIVITIES.

Courage is essential to many of the struggles which man must face, and they are not always confined to the conventional battlefield of contending armies. Good fights must often be fought in the course of every-day life. Nothing helps more to maintain courage in the face of severe obstacles than does a firm conviction in the rightness of the cause involved. It is doubly needed when the victory seems far away and the desired outcome is slow in arriving. It has recently been remarked that the question of living satisfactorily, in the present state of society, frequently resolves itself into combating the prevalent agencies of disease transmission. In addition to this, we are reminded further, are the dangers lurking in harmful foods, the hazard of acute poisoning, the menace of hereditary taint, the perils of degenerative disease, the attacks of pathogenic bacteria, and the deplorable functional disturbances. To face squarely the problems involved, Williams adds, requires more courage than some can muster.

From day to day, or even from year to year, the efforts of modern preventive medicine sometimes appear to have made little, if any, progress. We are reminded of the wealth of investigation devoted to the problems of tuberculosis, while the disease is still with us. All the many cancer research institutes throughout the world, so the pessimist argues, have not decreased the incidence of

the malady. Yet there are so many instances of great progress that one can easily recover courage and strengthen conviction through the mere enumeration of some of them. Against smallpox and yellow fever, the great victory has been sustained. Our latest annual summary of typhoid death rates in the large cities of the United States shows a continuance of the typhoid decline which has been so striking a factor of the epidemiology of the disease for the last twelve years.

We have already remarked that the condition in the larger cities for the most part may now be regarded with pride instead of being pointed to with obloquy as awful examples. However forceful exhaustive statistics may be, they sometimes do not impress the individual so directly as the perhaps less accurate data derived from a smaller range that comes within his personal observation. As an illustration of the changing health conditions in our American communities, we may cite an interesting personal experience recently recounted by a physician in one of the Southern States. Here is the striking testimony:

"During the five summer months of 1909, I saw 158 town patients. During the same period of 1922, I saw 202 town patients. Of the 158 patients seen in 1909, ninety-six had well-defined cases of malaria, with chill, fever, sweats, etc.; fifteen had cholera infantum ileocolitis, or dysentery, with two deaths, and seven had typhoid fever, making a total of 108 out of 158 that should have been prevented. During the five summer months of 1922, I did not have in town a single typical case of malaria, typhoid fever or cholera infantum. I had one atypical case of malaria that was most probably contracted out of town. I had only one case of ileocolitis that lasted over five days, and this was the only case of dysentery or infectious diarrhea in town this summer. There has not been a case of typhoid fever since February, 1919. Malaria, typhoid and infantile diarrhea have about disappeared."

Nor does this tell the entire story. Hookworm disease has been controlled in that community, and people once "sallow, anemic, sick and thin" have become "healthy, prosperous and happy." Here is the record of a community in which some one or, rather, many who had both courage and the conviction of their hygienic precepts have labored, and not in vain. Who shall say that health is not a purchasable commodity?—*Jour. A. M. A.*

SALT-RISING BREAD AND THE WELCH BACILLUS.

Until late in the nineteenth century, the preparation of bread was an uncertain and wasteful process; then Pasteur's work on fermentation led to the perfection of bakers' yeast and revolutionized the baking industry. Today bakers' bread is manufactured scientifically and with assurance. Many people, however, continue to prefer salt-rising bread, which until recently was baked at home in the crude manner of former centuries. Salt-rising bread has a distinctive flavor and odor, and its food value per unit of volume is comparatively high. It is not made with yeast, but, for sufficient gas to raise the dough, depends on chance inoculation with gas-producing organisms that naturally reside in flour. The organisms vary with different lots of dough. Thus, failures to obtain good bread are not infrequent. There are now on the market products intended to insure an abundance of gas for baking salt-rising bread, and some of these—so-called "bread starters"—are practically cultures of gas-producing micro-organisms.

Kohman,[1] in 1917, reported the isolation of a bacillus from salt-rising bread which he predicted would have far-reaching results on the salt-rising bread industry. It was said to be an exact parallel of the discovery of yeast. Two-thirds of the gas formed by this organism was said to be hydrogen, the remainder carbon dioxid. It was a spore-bearing bacillus, which, it was stated, produced no alcohol, and which perished during the process of baking. "Hence," it was said, "salt-rising bread is as sterile as bread made with yeast." "Bread starters" have since been concocted which, it seems, are not

sterilized during the process of baking.

Recently, Koser[2] investigated a commercial "bread starter" which was advocated for the preparation of salt-rising bread, and found that it contained large numbers of *Bacillus welchii* (*B. aerogenes-capsulatus*). It was a coarse, white powder composed of starch and certain alkaline salts in addition to the bacilli. According to directions accompanying the product, it is added to boiling hot milk and kept over night in a warm place. It is then added to hot water and flour to prepare the "sponge," which is allowed to rise; then more hot water, flour and other ingredients are added to make the dough. This is molded into loaves and baked. The addition of this starter to milk results, after incubation over night, in a frothy mass which, Koser estimated, contained from 1,000,000 to 100,000,000 *B. welchii* organisms per gram. After the bread was baked, and, in fact, after it was placed on sale, the bacillus was recovered from the interior of the loaves. In samples as small as 0.01 gm., taken from the interior of loaves, *B. welchii* was found in eighty-five out of ninety-two samples examined. Larger samples of bread, 1 and 5 gram samples, gave uniformly positive results. In decided contrast to these findings were results obtained in the examination of ordinary yeast bread, in forty 5 gram samples of which only three showed the presence of *B. welchii*. Negative results were obtained in all of the 0.1 gram samples of yeast bread examined.

Guinea-pigs were injected in the thigh muscles with 1.0 c.c. of twenty-four hour cultures in beef infusion broth containing a piece of cooked meat. The guinea-pig receiving the "bread starter" culture became quite ill after twenty-four hours. Its entire thigh and flank became swollen and tender, an ulcer formed which eventually healed with a scar, and the hair over the affected portion fell out. The guinea-pig injected with the culture obtained from loaves of salt-rising bread became somewhat sick after twenty-four hours, the thigh and flank became swollen, an extensive scar formed over the affected parts, and the hair was lost. Thus, it seems, the virulence of these organisms was not very high. Koser then prepared salt-rising bread by using a virulent strain of the Welch bacillus. He obtained a culture of the "Silverman" strain, which originally was isolated from a war wound, and substituted it in the "bread starter." The bread thus made compared favorably in texture and size with the bread prepared from the starter.

The association of the Welch bacillus with wound infections in man is well known. It has also been associated with acute intestinal disorders in connection with public water supplies. It is said, however, to be a common inhabitant of the intestinal tract of man, and to occur frequently in milk. Nevertheless, the use of an organism of this type in a commercial process would appear to be a questionable procedure. A safer course would be to employ in "bread starters" an organism which is, beyond question, harmless.—*Jour. A. M. A.*

1. Kohman, H. A.: Salt Rising Bread. Sc. Am. Supp. 84:212, 1917.
2. Koser, S. A.: Bacillus Welchii in Bread, J. Infect. Dis. 32:208 (March) 1923.

"HEALTH POSITIVE."

"Health is something positive, progressive, dynamic. It is not merely a vague and negative state of being which remains after active illness has subsided. It stabilizes and enriches life, and no effort is too great that helps to win it." This statement is found in the Foreword of the Handbook on Positive Health, issued by the Women's Foundation for Health, and expresses concisely the basis of the Foundation program. In fact the Foundation generally defines itself and its purpose as follows:

"To correlate the Health activities of National Women's organizations and to put on a program emphasizing the *positive* phase of health."

Each of the cooperating organizations is directly represented in the Foundation's House of Delegates by five members. This body meets each year in November for the discussion of policies, election of officers and

Board of Trustees, thus bringing into a fairly close correlation these organizations, and through their delegates establishing contact with the combined membership of 10,000,000 women. This machinery was set up in the fall of 1919, following a program for Health put on by the War Department for American women, to parallel the one put on for men throughout the training camps. It was found, in presenting this War Campaign, that women responded much more quickly and uniformly to a broadly constructive health-building program than to one centering alone on disease and its treatment. At the close of this campaign, in 1919, a six weeks' International Conference of Medical Women was held in New York City; leading club women were invited in for the concluding three days of the conference and the Women's Foundation for Health resulted.

It was immediately seen that the first step must be to educate the women of the country in positive health, and the second to arouse them to assume their own individual responsibility to attain it. In consequence the Positive Health Series, a common text was prepared in cooperation with the Council on Health and Public Instruction of the American Medical Association, and the Bureau of Social Education of the National Board of the Young Women's Christian Association. As the Foreword of the Series states: "At numerous points, the health education program outlined in this series of pamphlets, directs the individual toward trained medical assistance when that is needed, but the paramount aim of the Foundation is to awaken a personal ambition to achieve health." The names of E. V. McCollum, Walter B. Cannon, Wm. A. White, E. C. Lindeman, and Jessie Taft, as contributors to the Series, place it above the average in scientific accuracy. At the same time the Series may be easily read by the average person. The titles of the six pamphlets, listed below, correspond to the Chapter headings of the Handbook on Positive Health, which includes the material printed in the pamphlets:

Pamphlet No. 1—"The Newer Conception of Health."

Pamphlet No. 2—"The Individual and the Community."

Pamphlet No. 3—"Nutrition in Relation to Health and Efficiency."

Pamphlet No. 4—"Mental Health."

Pamphlet No. 5—"The Heritage of Life."

Pamphlet No. 6—"Recreation."

This Series came off the American Medical Association press last summer at about the time the Foundation set up its independent headquarters and staff and announced its program headed with these two objectives:

OBJECTIVES.

I. To establish the conviction that health is generally attainable through individual effort and responsibility.

II. To establish the conviction that mental health is as procurable as physical health.

To approach these objectives the Foundation advises health inventories followed by periodic examinations; correct daily health habits and exercises; education in food values; adequate knowledge of the process of reproduction; adaptation of recreation to individual need; adjustment of work and living conditions to the individual's physical and mental capacity.

Can this program be interpreted by the average community? There is no question but that it *can* be if the proper cooperation is developed in the community between the women's organizations interested in it and the members of the local medical profession. It will take both to bring about desired objectives. Women are already fairly alive to the possibilities of physical and mental development up to the limit of the individual's capacity. They have seen such development demonstrated through the effort to improve child health; they saw it done in the training camp through a well-regulated day; many of them know that approximately 80 per cent of the women about them who consider themselves well are really carrying around liabilities which could, in a vast majority of cases, become assets through the individual's own efforts. As the number of these who possess

this knowledge increases, public opinion is going to operate toward health examinations and all that is involved in the findings of that examination. The physician who finds himself ready to meet the demands thus set up is bound to have open to him an avenue of increasing opportunities; for the Foundation in no way belittles the necessary curative and preventive measures already forming the physician's practice, but instead, adds to that practice the practically new field of maintaining health. The physician who looks keenly into the difference between a disease-finding examination and a health examination, who assumes the responsibility of attending as seriously to the making of health as he does to the curing of disease, has promise of a usefulness and service unmeasured by his present days.

The result of such cooperation must, of necessity, be gratifying on both sides, for the number of those in a community who understand and demand "positive health" must be a measure of the intelligent support the physician will receive from that community; this increased support of the physician must, in its turn, be a strong factor in furthering all efforts toward community welfare, as a more intelligent interpretation of all laws relating to health must result from such cooperation and education.

VENTILATION.

To keep on living everybody must have sufficient air to breathe; and to keep on being healthy this air should be sufficiently pure and sufficiently moist and sufficiently cool, says the U. S. Public Health Service. By ventilation all these ends are sought to be attained.

In the open air, away from noxious gases, ventilation looks after itself; elsewhere, particularly in houses or in any closed spaces, it must be looked after. No matter how pure the air in such a space may be, anyone who enters it at once begins to pollute it with his breath; and it will ultimately become injurious to health unless it is renewed either by natural means (such as the wind) or by artificial means.

Renewal is necessary because when "breathing in" one takes away something from the air (oxygen); and when "breathing out" one adds something to the air (carbon dioxide). Oxygen is taken from inbreathed air by the blood that circulates through the lungs and is carried away to help the food build up the body, keep it warm, and energize it—give it power to move. Oxygen constitutes about one-fifth of the air; and about one-half of that one-fifth is breathed out, unchanged, and may be breathed over again.

Carbon dioxide is part of the waste that is left over in the body when oxygen and food combine to build up the body, etc. It is picked up by the blood, carried to the lungs, and breathed out. It is poisonous and injures the body when it is breathed in again.

Rosenau estimates (1917) that to keep healthy a man weighing 160 pounds needs 2,400 cubic feet of fresh air every hour when resting; 3,200 when doing light work; and 6,100 when doing hard work. A woman weighing 120 pounds needs five-sixths as much; and a child weighing 80 pounds needs seven-twelfths as much.

Factories, churches, theatres, offices, etc., all need abundant supplies of fresh air. Factories need them most of all, for persons doing physical labor breathe faster than those who are sitting quietly; and most factories use more or less machinery, whose fires use up (burn) oxygen and release carbon dioxide faster than the breath of many men.

The simplest way of renewing used air by a supply of unused air is by opening the windows; but unless these are very carefully placed and supervised they seldom distribute the air evenly and they often cause persons in one part of a workroom to suffer from heat and bad air while those in other parts shiver and sneeze. Furthermore, in many factories the windows are constantly being obstructed by materials that are put there "temporarily" but are left there eternally. However, in these days the complaint committee of the workers

can usually be trusted to see to the removal of such things.

If natural ventilation is insufficient the best way to renew the air in factories is by the use of big electric fans so placed as to draw off the foul air, or to drive in the fresh air, or both.

Temperature and humidity (per cent of moisture in the air) are also closely associated with ventilation. The body heat given off by persons congregated in a workroom, church, theatre or other buildings raises the temperature and increases the moisture. When the temperature rises above 86 degrees Fahrenheit, and the humidity above 80 per cent they cause considerable discomfort; when they rise higher they cause suffering; and when they rise still higher they may cause heatstroke. In winter, on the other hand, the heated air in buildings is usually too dry; often the humidity falls to 20 per cent, which is lower than that in a desert. Air as dry as this draws moisture from the skin and from the mucous membranes of the nose, throat, and mouth and irritates them. To be comfortable the humidity of a workroom should be about 50 per cent; and it would pay the plant manager to see that it is kept that high, for at 50 per cent less heat is necessary and coal is saved; a temperature of 62 degrees Fahrenheit is quite high enough if the work is active.

The ventilation of many factories and offices depends on factors over which the workers may have little control. At home, however, in their rooms they have fewer or no other persons to consider and may be able to insist on pure air, especially at night.

The idea that night air is unhealthy and must be shut out is a survival from the days when men barricaded themselves to keep enemies from stealing upon them under cover of darkness; it was reinforced later, before window screens were invented, when malaria-bearing mosquitoes entered by night through unclosed windows. Night air is exactly like day air; and neither of them is anything like so injurious as the air in a room whose windows are closed and whose door is probably never opened all night long, no matter how many persons are breathing into it carbon dioxide—and rebreathing it—all night long.

If drafts upon the bed are feared they may be prevented by getting a piece of board about 12 inches wide and nearly as long as the window sash is wide. Raise the lower sash, slip the board in beneath it, and draw the sash down upon it. Outside air will travel upward between the two sashes and spill into the room over the top of the lower sash. This is nothing like so satisfactory as having the upper sash completely down, but it will do a lot for that sick, headachy feeling that you have had every morning on waking up.

For further information write to the Surgeon General, U. S. Public Health Service, Washington, D. C., for Reprint 729: Efficiency of various systems of air—conditioning, etc.

NEW AND NONOFFICIAL REMEDIES.

DIPHTHERIA TOXIN AND CONTROL FOR SCHICK TEST-P. D. & Co.—A diphtheria immunity test (New and Nonofficial Remedies, 1922, p. 320), marketed in packages containing one vial of 0.1 cc. of undiluted, standardized diphtheria toxin, one vial of 5 cc. of sterile physiologic solution of sodium chloride, one vial of 5 cc. of diluted control of Schick test and one sterile syringe point. Each package contains material sufficient for fifty doses. Parke, Davis & Co., Detroit, Mich. (*Jour. A. M. A.*, Feb. 17, 1923, p. 475.)

SCHICK TEST-LILLY.—A diphtheria immunity test (see New and Nonofficial Remedies, 1922, p. 320), marketed in packages containing one vial of diphtheria toxin sufficient for ten tests and a vial of sterile physiological solution of sodium chloride and in packages of ten vials containing toxin sufficient for one hundred tests accompanied by ten vials of sterile physiological solution of sodium chloride. As a control, the Schick test control, representing diphtheria toxin of the same lot treated to destroy the specific exotoxins, is supplied. Eli Lilly and Co., Indianapolis, Ind. (*Jour. A. M. A.*, Feb. 25, 1922, p. 553.)

PUBLISHER'S NOTE

AN IMPRESSIVE MARGIN OF SAFETY.

Dr. Hare says "any drug possessed of power has a toxic dose." It is possible to give too much of it. The practical question concerning all therapeutic agents is: "Is it efficient in non-toxic doses?" This question has been very carefully threshed out in the case of Mercurosal, the new mercurial offered by Parke, Davis & Co. Chemical tests of purity, to establish the uniformity of successive lots, are applied. But the manufacturers are not content with this. As in the case of Adrenalin, chemical tests are seconded and reinforced by physiologic tests. Rabbits and other animals are used for the test. Should an intravenous dose of 20 to 25 milligrams per kilo of body weight kill the animal, the drug is rejected, even though the chemical test may have shown it to be pure. On the animal test basis, the lethal dose for a man weighing 68 kilos, or 150 pounds, would be at least 1,300 milligrams (1.3 gm.), *thirteen times the recommended intravenous dose.* The practical safety of Mercurosal in the recommended dose seems therefore to be assured. As to the efficiency of this dose, the clinic alone can furnish the necessary data, and we understand that the manufacturers have reprinted some illuminating clinical papers on this subject.

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Further information from Col. Raymond C. Turck, State Health Officer, Jacksonville, Florida.

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